a fourth mixer to mix the received TV signal and the output of the third programmable divider and frequency convert the received TV signal into an intermediate-frequency signal having a third frequency,

A3

wherein the local oscillator outputs an oscillation signal having a frequency band of at least 767 to 473 MHz, wherein a dividing rate of the second programmable divider is 1/3, and a dividing rate of the third programmable divider is 1/6.

REMARKS

Applicants have rewritten Claims 1-4, 6-16, and 18-27 for grammatical purposes only. No new matter has been added as a result of this amendment. The changes from the previous version to the rewritten version are shown in attached Appendix A.

In addition, Applicants have enclosed a corrected version of Fig. 3 with corrections marked in red. Applicants request the Examiner approve the corrections and will submit formal drawings upon receiving a Notice of Allowance.

Respectfully submitted,

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APPENDIX A
Attorney Docket No. 9281-4199
TV Signal Receiving Tuner Capable of Outputting Oscillation Signal Having Wide Frequency Band by Means of Single Local Oscillator
Takeo Suzuki et al.

In the Claims

Please amend Claims 1-4, 6-16, and 18-27 as follows:

1. (Amended) A TV signal receiving tuner for receiving TV signals by dividing ~~them~~ the TV signals into a plurality of frequency bands, comprising:

a local oscillator which oscillates at a frequency range corresponding to a received TV signal having a predetermined frequency band;

a first programmable divider which receives a local oscillation signal of the local oscillator and divides the local oscillation signal; and

a first mixer which mixes the received TV signal and ~~the~~ an output of the first programmable divider and frequency converts the received TV signal into an intermediate-frequency signal having a predetermined frequency, wherein

a dividing rate of the first programmable divider is variable and set to 1 to receive ~~the~~ a TV signal having a ~~predetermined~~ first frequency band and to at most 1/2 ~~or less~~ to receive a TV signal having a second frequency band, the second frequency band being lower than the ~~predetermined~~ first frequency band.

2. (Amended) A TV signal receiving tuner for receiving TV signals by dividing them into a plurality of frequency bands, comprising:

a local oscillator which oscillates at a frequency range corresponding to a received TV signal having a predetermined frequency band;

a second programmable divider which receives a local oscillation signal of the local oscillator and divides the local oscillation signal;

a second mixer which mixes the received TV signal and the local oscillation signal and frequency converts the received TV signal into an intermediate-frequency signal having a ~~predetermined~~ first frequency; and

a third mixer which mixes the received TV signal and ~~the~~ an output of the second programmable divider and frequency converts the received TV signal into an intermediate-frequency signal having a ~~predetermined~~ second frequency,

wherein frequency conversion is carried out by the second mixer to receive ~~the~~ a TV signal having a ~~predetermined~~ first frequency band, and

wherein frequency conversion is carried out by the third mixer to receive ~~the~~ a TV signal having a frequency band lower than the ~~predetermined~~ first frequency band.

3. (Amended) The TV receiving tuner according to claim 2, wherein a dividing rate of the second programmable divider is variable and ~~changed according to an area where it is used~~dependent upon a geographical location in which the TV receiving tuner is disposed.

4. (Amended) The TV receiving tuner according to claim 1, ~~wherein~~ further comprising:

a first tracking filter ~~for selecting~~to select the TV signal having ~~a~~ ~~predetermined~~the first frequency band; ~~and~~

a second tracking filter ~~for selecting~~to select the TV signal having ~~a~~ the second frequency band ~~lower than the predetermined frequency band are~~ arranged in parallel to ~~each other, wherein~~ the first tracking filter; and

a PLL IC ~~for outputting~~to output a tuning voltage ~~for changing the~~ that changes a frequency of the local oscillation signal output from the local oscillator ~~is provided~~, ~~and~~

wherein the tuning voltage is applied to the first tracking filter and the second tracking filter to tune a pass band of one of the first tracking filter ~~or~~ and the second tracking filter to a frequency of ~~a~~ the TV signal to be received.

6. (Amended) The TV receiving tuner according to claim 5, ~~wherein~~ further comprising:

a low-noise first preamplifier having an automatic gain control (AGC) function ~~is~~ provided after the first tracking filter~~,~~; and ~~wherein~~

a low-noise second preamplifier having an AGC function ~~is~~ provided after the second tracking filter.

7. (Amended) The TV receiving tuner according to claim 6, ~~wherein~~ <u>further comprising:</u>

a first image trap circuit ~~for attenuating~~<u>to attenuate</u> an image frequency signal corresponding to ~~a~~ <u>the</u> TV signal to be received ~~is~~ interposed between the first preamplifier and the second mixer~~,~~<u>;</u> and ~~wherein~~

a second image trap circuit ~~for attenuating an~~ <u>to attenuate the</u> image frequency signal corresponding to ~~a~~ <u>the</u> TV signal to be received ~~is~~ interposed between the second preamplifier and the third mixer.

8. (Amended) The TV receiving tuner according to claim 1, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 847 to 505 MHz, and wherein the dividing rate of the first programmable divider ~~can be changed to at least~~<u>may be set to different values including</u> 1, 1/3 and 1/5.

9. (Amended) The TV receiving tuner according to claim 1, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 803 to 473 MHz, and wherein the dividing rate of the first programmable divider ~~can be changed to at least~~ <u>may be set to different values including</u> 1, 1/3 and 1/9.

10. (Amended) The TV receiving tuner according to claim 1, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 824 to 530 MHz, and wherein the dividing rate of the first programmable divider ~~can be changed to at least~~ <u>may be set to different values including</u> 1, 1/3 and 1/4.

11. (Amended) The TV receiving tuner according to claim 1, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 767 to 473 MHz, and wherein the dividing rate of the first programmable divider ~~can be changed to at least~~ <u>may be set to different values including</u> 1, 1/3 and 1/6.

12. (Amended) The TV receiving tuner according to claim 2, ~~wherein the tuner comprises~~<u>further comprising:</u>

a third programmable divider ~~for receiving~~<u>to receive</u> the oscillation signal of the local oscillator and ~~dividing~~ <u>divide</u> the oscillation signal<u>;</u> and

a fourth mixer ~~for mixing~~<u>to mix</u> the received TV signal and ~~the~~ <u>an</u> output of the third programmable divider and frequency convert~~ing~~ the received TV signal into an intermediate-frequency signal having a ~~predetermined~~ <u>third</u> frequency,

wherein the local oscillator outputs an oscillation signal having a frequency band of at least 847 to 505 MHz, ~~wherein the~~ and a dividing rate of the second programmable divider is 1/3, and wherein ~~the~~ a dividing rate of the third programmable divider is 1/5.

13. (Amended) The TV receiving tuner according to claim 2, ~~wherein the tuner comprises~~further comprising:

a third programmable divider ~~for receiving~~to receive the oscillation signal of the local oscillator and ~~dividing~~ divide the oscillation signal; and

a fourth mixer ~~for mixing~~to mix the received TV signal and ~~the~~ an output of the third programmable divider and frequency convert~~ing~~ the received TV signal into an intermediate-frequency signal having a ~~predetermined~~ third frequency,

wherein the local oscillator outputs an oscillation signal having a frequency band of at least 803 to 473 MHz, ~~wherein the~~ and a dividing rate of the second programmable divider is 1/3, and wherein ~~the~~ a dividing rate of the third programmable divider is 1/9.

14. (Amended) The TV receiving tuner of claim 2, ~~wherein the tuner comprises~~ further comprising:

a third programmable divider ~~for receiving~~to receive the oscillation signal of the local oscillator and ~~dividing~~ divide the oscillation signal; and

a fourth mixer ~~for mixing~~to mix the received TV signal and ~~the~~ an output of the third programmable divider and frequency convert~~ing~~ the received TV signal into an intermediate-frequency signal having a ~~predetermined~~ third frequency,

wherein the local oscillator outputs an oscillation signal having a frequency band of at least 824 to 530 MHz, ~~wherein the~~ and a dividing rate of the second programmable divider is 1/3, and wherein ~~the~~ a dividing rate of the third programmable divider is 1/4.

15. (Amended) The TV receiving tuner according to claim 2, ~~wherein the tuner comprises~~ further comprising:

a third programmable divider ~~for receiving~~to receive the oscillation signal of the local oscillator and ~~dividing~~ divide the oscillation signal; and

a fourth mixer ~~for mixing~~to mix the received TV signal and ~~the~~ an output of the third programmable divider and frequency convert~~ing~~ the received TV signal into an intermediate-frequency signal having a ~~predetermined~~ third frequency,

wherein the local oscillator outputs an oscillation signal having a frequency band of at least 767 to 473 MHz, ~~wherein the~~ and a dividing rate of the second programmable divider is 1/3, and wherein ~~the~~ a dividing rate of the third programmable divider is 1/6.

16. (Amended) The TV receiving tuner according to claim 2, ~~wherein~~ further comprising:

a first tracking filter ~~for selecting~~to select the TV signal having ~~a~~ ~~predetermined~~the first frequency band; ~~and~~

a second tracking filter ~~for selecting~~to select the TV signal having ~~a~~ the second frequency band ~~lower than the predetermined frequency band are~~ arranged in parallel to ~~each other, wherein~~ the first tracking filter; and

a PLL IC ~~for outputting~~to output a tuning voltage ~~for changing the~~ that changes a frequency of the local oscillation signal output from the local oscillator ~~is provided~~, and

wherein the tuning voltage is applied to the first tracking filter and the second tracking filter to tune a pass band of one of the first tracking filter ~~or~~ and the second tracking filter to a frequency of ~~a~~ the TV signal to be received.

18. (Amended) The TV receiving tuner according to claim 17, ~~wherein~~ further comprising:

a low-noise first preamplifier having an automatic gain control (AGC) function ~~is~~ provided after the first tracking filter~~,~~; and ~~wherein~~

a low-noise second preamplifier having an AGC function ~~is~~ provided after the second tracking filter.

19. (Amended) The TV receiving tuner according to claim 18, ~~wherein~~ further comprising:

a first image trap circuit ~~for attenuating~~to attenuate an image frequency signal corresponding to ~~a~~ the TV signal to be received ~~is~~ interposed between the first preamplifier and the second mixer~~,~~; and ~~wherein~~

a second image trap circuit ~~for attenuating an~~ to attenuate the image frequency signal corresponding to ~~a~~ the TV signal to be received ~~is~~ interposed between the second preamplifier and the third mixer.

20. (Amended) The TV receiving tuner according to claim 16, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 847 to 505 MHz, and wherein the dividing rate of the first programmable divider ~~can be changed to at least~~ may be set to different values including 1, 1/3 and 1/5.

21. (Amended) The TV receiving tuner according to claim 16, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 803 to 473 MHz, and wherein the dividing rate of the first programmable divider ~~can be changed to at least~~ may be set to different values including 1, 1/3 and 1/9.

22. (Amended) The TV receiving tuner according to claim 16, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 824 to 530 MHz, and wherein the dividing rate of the first programmable divider ~~can be changed to at least~~ may be set to different values including 1, 1/3 and 1/4.

23. (Amended) The TV receiving tuner according to claim 16, wherein the local oscillator outputs an oscillation signal having a frequency band of at least 767 to 473 MHz, and wherein the dividing rate of the first programmable divider ~~can be changed to at least~~ may be set to different values including 1, 1/3 and 1/6.

24. (Amended) The TV receiving tuner according to claim 4, ~~wherein the tuner comprises~~further comprising:

a third programmable divider ~~for receiving~~to receive the oscillation signal of the local oscillator and ~~dividing~~ divide the oscillation signal; and

a fourth mixer ~~for mixing~~to mix the received TV signal and ~~the~~ an output of the third programmable divider and frequency convert~~ing~~ the received TV signal into an intermediate-frequency signal having a ~~predetermined~~ third frequency,

wherein the local oscillator outputs an oscillation signal having a frequency band of at least 847 to 505 MHz, ~~wherein the~~ and a dividing rate of the second programmable divider is 1/3, and wherein ~~the~~ a dividing rate of the third programmable divider is 1/5.

25. (Amended) The TV receiving tuner according to claim 4, further comprising: ~~wherein the tuner comprises~~

a third programmable divider to receive ~~for receiving~~ the oscillation signal of the local oscillator and divide ~~dividing~~ the oscillation signal; and

a fourth mixer to mix ~~for mixing~~ the received TV signal and the output of the third programmable divider and frequency convert~~ing~~ the received TV signal into an intermediate-frequency signal having a third ~~predetermined~~ frequency,

wherein the local oscillator outputs an oscillation signal having a frequency band of at least 803 to 473 MHz, wherein ~~the~~ a dividing rate of the second programmable divider is 1/3, and ~~wherein the~~ a dividing rate of the third programmable divider is 1/9.

26. (Amended) The TV receiving tuner according to claim 4, further comprising: ~~wherein the tuner comprises~~

a third programmable divider to receive ~~for receiving~~ the oscillation signal of the local oscillator and divide ~~dividing~~ the oscillation signal; and

a fourth mixer to mix ~~for mixing~~ the received TV signal and the output of the third programmable divider and frequency convert~~ing~~ the received TV signal into an intermediate-frequency signal having a third ~~predetermined~~ frequency,

wherein the local oscillator outputs an oscillation signal having a frequency band of at least 824 to 530 MHz, wherein ~~the~~ a dividing rate of the second programmable divider is 1/3, and ~~wherein the~~ a dividing rate of the third programmable divider is 1/4.

27. (Amended) The TV receiving tuner according to claim 4, further comprising:~~wherein the tuner comprises~~

a third programmable divider to receive ~~for receiving~~ the oscillation signal of the local oscillator and divide ~~dividing~~ the oscillation signal; and

a fourth mixer to mix ~~for mixing~~ the received TV signal and the output of the third programmable divider and frequency convert~~ing~~ the received TV signal into an intermediate-frequency signal having a third ~~predetermined~~ frequency,

wherein the local oscillator outputs an oscillation signal having a frequency band of at least 767 to 473 MHz, wherein ~~the~~ a dividing rate of the second

programmable divider is 1/3, and ~~wherein the~~ a dividing rate of the third programmable divider is 1/6.